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Bulletin 423 September 1955

THE UNIVERSITY OF NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION
Department of Agricultural and Biological Chemistry

Inspection of Commercial Fertilizers

Made for the

STATE DEPARTMENT OF AGRICULTURE

H. A. DAVIS and V. F. STAAB

THE UNIVERSITY OF NEW HAMPSHIRE
DURHAM, N. H.

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the
State Department of Agriculture

The inspection of commercial fertilizers reported in this bulletin was made under the direction of the Honorable Perley I. Fitts, Commissioner of Agriculture. Mr. George H. Laramie, Fertilizer Control Supervisor, and Mr. Harold W. Ayer, Assistant Control Supervisor, collected 125 samples of mixed fertilizer and fertilizer materials which were offered for sale by dealers or had been delivered to consumers during the year ending June, 1955. The general character of the brands sampled is shown by the following classification:

THE FERTILIZER LAW

Complete fertilizer	77
Phosphoric acid and potash	11
Nitrogen and Phosphoric acid	2
Superphosphate	8
Nitrate of Soda	1
Ammonium nitrate	2
Ammonium sulphate	1
Muriate of Potash	1
Ground bone	5
Natural manures	8
Tankage	2
Urea	1
Liquid-complete	3
Liquid-dilute	3

The New Hampshire Fertilizer Law has been rewritten so as to conform as nearly as possible, and still fit New Hampshire conditions, with the Model Fertilizer Law approved by the Association of American Fertilizer Control Officials. It was passed by the 1955 Session of the Legislature and **becomes effective on January 1, 1956.** Since this bulletin covers the inspection year 1954-55, the old law applies to all work reported here. All questions concerning the registration of brands and matters relating to the provisions of the law should be addressed directly to the Fertilizer Control Supervisor, State House, Concord, New Hampshire. All manufacturers and dealers selling fertilizers in New Hampshire should obtain a copy of the law and any proposed regulations from the above office for their guidance.

Under the new law registrations will expire on January 1 of each year. The registration fee has been increased to $10.00 for each element but not to exceed $25.00 for each brand. Penalty clauses are provided for deficiencies greater than specified tolerance, the detail of which is specified in the law. Provision is also made for "stop sale" orders, seizure, and the prescribing of Rules and Regulations by the Commissioner.

The exact provisions of the new law concerning the registration, guarantee and labeling of Commercial Fertilizers in New Hampshire are quoted as follows:

"Registration. (a) Each brand and grade of commercial fertilizer shall be registered before being offered for sale, sold or distributed in this state. The application for registration shall be submitted to the commissioner on forms furnished by the commissioner, and shall be accompanied by a fee, per brand, as follows: ten dollars for the phosphoric acid, ten dollars for the nitrogen, ten dollars for the potash, and ten dollars for the magnesium oxide, or other plant food elements, compounds or classes of compounds; contained or claimed to be in the said brand of fertilizer; but the fee for any brand shall not exceed twenty-five dollars. All registrations expire on or before January 1, annually. The application shall include the following information in the following order: (1) The name and address of the person guaranteeing the fertilizer. (2) The brand and grade. (3) The guaranteed analysis showing the minimum percentage of plant food claimed in the following order and form: Total nitrogen....per cent; available phosphoric acid....per cent; soluble potash....per cent. Unacidulated mineral prosphatic materials and basic slag shall be guaranteed as to both total

and available phosphoric acid, and the degree of fineness. In the case of bone, tankage, and other natural organic phosphate materials, only the total phosphoric acid, need be guaranteed. Additional plant food elements, determinable by chemical methods, may be guaranteed only by permission of the commissioner by and with the advice of the director of the agricultural experiment station. When any such additional plant foods are claimed, they shall be included in the guarantee, and shall be subject to inspection and analysis in accordance with the methods and regulations that may be prescribed by commissioner.

(b) A distributor shall not be required to register any brand of commercial fertilizer which is already registered hereunder by another person.

(c) The plant food content of each and every brand of commercial fertilizer must remain uniform for the period of registration.

Labeling. (a) Any commercial fertilizer offered for sale or sold or distributed in this state in bags, barrels, or other containers shall have placed on or affixed to the container in written or printed form the net weight and the information required. (1), (2), and (3) of paragraph (a) of section 4 either (1) on tags affixed to the end of the package between the ears and/or on the sewed end or (2) directly on the package. (b) If distributed in bulk, a written or printed statement of the weight and the information required by (1), (2) and (3) of paragraph (a) of section 4, shall accompany delivery and be supplied to the purchaser."

The chief purpose of the official inspection required by the fertilizer law is to protect the consumer against misbranded products that doubtless would soon appear on the market if the sale of fertilizer was not under state regulation. The purchaser of fertilizer should be acquainted with the fertilizer law and familiar with the information given on labels as required by law. If he accepts fertilizer not tagged in compliance with the law, he does so at his own risk.

A commercial fertilizer generally supplies one or more of three elements, nitrogen, phosphorus and potassium to the soil. These are expressed in terms of **nitrogen, phosphorous pentoxide** and **potash,** and the symbols used are N, P_2O_5 and K_2O respectively. The term phosphoric acid that has been used for years when speaking of the phosphorus content of a fertilizer is being slowly discarded because it does not name the compound actually meant in the fertilizer. In fact the use of the element designation N, P, and K is appearing more and more in everyday talk but expression of these fertilizer constituents in terms of the element is common only in the case of nitrogen, N. It is anticipated that it will not be many years before phosphorus, P, and potassium, K, will also be expressed in terms of the element. Research workers in agricultural experiment stations and industrial research groups are constantly studying the needs of the soil to improve crop yields. Under specific conditions elements such as magnesium, boron and other so-called minor elements are needed to correct soil deficiencies in certain localities. These may be included in the mixed fertilizer.

Much advertising of fertilizer materials packed in small packages is directed to the attention of the small home gardener and growers of house plants. It is realized that the owner of a few house plants does not want to buy a large bag of fertilizer for his or her needs and such small packaged material serves a definite need. However, certain advertising claims have been open to question and perhaps "miracle" results may not always be obtained. In general it is more economical for the gardener to purchase fertilizer of a reliable brand and in reasonably large packages.

During the past year considerable interest was aroused in the use of liquid fertilizers and their application by tank truck operators. This interest was directed especially to the care of lawns. The problems are many and cannot be adequately discussed here. The costs may be quite high and the first great interest appears to have subsided. There is a definite place for liquid fertilizers, since they are quickly available due to the fact they are already in solution. It is felt that each case should be considered and its needs carefully studied for the successful use of these new materials.

All control officials charged with the enforcement of state laws regulating the sale of commercial fertilizers and fertilizer materials are joined in the Association of American Fertilizer Control Officials. Research workers employed by State or Federal Agencies engaged in the investigation of fertilizers are also members of this Association. The object of this organization is to "promote

uniform and effective legislation, definitions, rulings, and enforcement of laws relating to the control of sale and distribution of mixed fertilizers and fertilizer materials in the Continent of North America. At the annual meetings of the Association reports and recommendations of investigators concerning definitions of fertilizer materials, use of new products, and problems concerning regulation of the fertilizer trade are discussed in detail. Fertilizer manufacturers are invited to participate in these discussions and through mutual co-operation the farmer is supplied with a product that can be relied upon to do the job expected in crop production. The official publication of the Association may be obtained for a small fee through the office of its secretary, B. D. Cloaninger, Clemson, South Carolina. This booklet contains the official terms describing fertilizer materials, a proposed model state fertilizer law as well as the proceedings of the annual meeting.

Whether or not a fertilizer contains the guaranteed amount of plant food can be determined only by a chemical analysis. For this reason it is considered necessary that each brand of fertilizer offered for sale be officially sampled and analyzed each year. When failure to meet the guarantee is proved by chemical analysis, the prosecution or seizure provisions of the law may be invoked. The purchaser's refusal to buy a fertilizer which does not conform to the law will not only assist in the enforcement of the law but will at the same time insure him the protection of the law.

USE OF COMMERCIAL FERTILIZERS

It is not within the scope of this department to make recommendations regarding the use of commercial fertilizers. The Department of Agronomy and the Department of Agricultural and Biological Chemistry of the University of New Hampshire Agricultural Experiment Station test soils and conduct experimental work with various fertilizer materals on hay and crop land. The Department of Horticulture investigates fertilizer treatments for fruits and vegetables. Much of this work has been published, and is available for free distribution to residents of New Hampshire. Address your request to Mail Service, University of New Hampshire, Durham, New Hampshire. A list of currently available publications on fertilization follows:

Sta. Cir.	58	Fertilizer Needs of Alfalfa on New Hampshire Soils.
Sta. Cir.	59	Effect of Soil Moisture and Fertilizer Placement on Vitality of the Potato Seed Piece.
Sta. Cir.	61	Fertility Needs of Dairy Farm Crops in the Connecticut Valley.
Sta. Cir.	63	Fertilizers for Sweet Corn.
Sta. Cir.	74	The Response of Clover and Total Forage to Top-Dressing Fertilizers.
Ext. Bull.	125	Growing Strawberries in New Hampshire.
Ext. Bull.	129	Forage Crop Production in New Hampshire.
Ext. Bull.	130	Care of the Established Lawn.
Ext. Bull.	324	Experiment with Potatoes.
Ext. Cir.	275	Culture of Low-Bush Blueberries.
Ext. Cir.	309	Growing Grapes in New Hampshire.
Ext. Cir.	310	Cane Fruit Culture.
Ext. Cir.	314	Tomatoes for New Hampshire.
Ext. Bull.	100	Growing Apples in New Hampshire.
Ext. Bull.	104	Growing Vegetables At Home.
Ext. Bull.	105	Asparagus in New Hampshire.
Ext. Bull.	116	Hotbeds and Coldframes.
Ext. Bull.	118	Growing Potatoes in New Hampshire.
Folder		New Hampshire Recommendations for Seed, Fertilizer and Lime.

While the word fertilizer does not appear in all of the above titles, none is included which does not discuss the use of fertilizer.

CONFORMITY TO GUARANTEE

The chemical analyses reported in this bulletin were made by the methods adopted by the Association of Official Agricultural Chemists. The following list shows the number of deficiencies found.

Number of samples analyzed	125
Equalling or exceeding all guarantees	66
Deficient in nitrogen only	23
Deficient in available phosphoric acid only	18
Deficient in potash only	6
Deficient in nitrogen and phosphoric acid	5
Deficient in nitrogen and potash	3
Deficient in phosphoric acid and potash	2
Deficient in nitrogen, phosphoric acid or potash	2

Twenty-one brands were guaranteed to contain magnesium oxide. All equalled or exceeded the guarantee.

Fertilizers are largely mixtures of chemicals. Segregation of these materials in the bag is difficult to prevent. Modern methods of fertilizer manufacture are doing much to process the fertilizer in such a way that segregation will be avoided. The solution of this problem is difficult. To obtain a truly representative sample of a fertilizer mixture requires careful work. The chemist can accurately determine the nitrogen, phosphoric acid, and potash content of the sample sent to the laboratory. If this sample does not correctly represent the larger lot, the analytical work is of no use. The obligation of the fertilizer control program is to see that the manufacturer is supplying the guaranteed amount of plant food to the consumer. For this reason the sample must be drawn and analyzed very carefully so that injustice will not be done to either the consumer or manufacturer.

In the tabulation of the analyses in the following pages, deficiencies of one-half of one per cent or more are shown in red type. The names of the manufacturers are arranged alphabetically. The brand names are listed alphabetically, or numerically by formula, under the manufacturer.

	Sample Drawn In	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Allied Chemical & Dye Corp. New York, New York											
*Arcadian A-N-L Pelleted Fertilizer Compound	Colebrook	20.5	20.65	....	....	....	....	....	....	....	....
Arcadian Urea 45 Fertilizer Compound	Concord	45.00	45.06	....	....	....	....	....	....	....	....
American Agricultural Chemical Co. North Weymouth, Mass.											
AA Quality Fertilizer 3-12-12	Colebrook	3.00	3.01	....	....	12.00	11.46	12.00	12.58	....	....
AA Fertilizer 5-8-7	Londonderry	5.00	5.00	....	8.96	8.00	8.51	7.00	7.04	....	....
AA Fertilizer 5--10-10	Londonderry	5.00	5.02	....	10.44	10.00	10.02	10.00	10.00	....	....
AA Quality Fertilizer 5-10-10	Concord	5.00	5.00	....	10.27	10.00	9.83	10.00	10.00	....	....
AA Quality Fertilizer 5-10-10	Laconia	5.00	5.00	....	10.26	10.00	9.85	10.00	10.32	....	....
AA Quality Fertilizer 5-10-10	Concord	5.00	5.01	....	10.55	10.00	10.21	10.00	10.24	....	....
AA Fertilizer 7-7-7	Londonderry	7.00	7.01	....	7.66	7.00	7.39	7.00	7.12	....	....
AA Quality Fertilizer 8-16-16	Contoocook	8.00	7.85	....	17.62	16.00	17.25	16.00	15.72	....	....
AA Quality Fertilizer 8-16-16	Concord	8.00	7.86	....	17.57	16.00	17.19	16.00	16.48	....	....
AA Quality Fertilizer 8-16-16	Colebrook	8.00	7.88	....	16.80	16.00	16.46	16.00	16.70	....	....
AA Quality Fertilizer 10-10-10	Lebanon	10.00	9.53	....	10.90	10.00	10.48	10.00	10.00	....	....
Agrico for New England 5-8-7	Concord	5.00	5.00	....	8.73	8.00	8.40	7.00	6.64	....	....
Agrico for New England 5-8-7	Nashua	5.00	4.82	....	8.19	8.00	7.73	7.00	6.80	....	....
Agrico for Top Dressing 7-7-7	Nashua	7.00	6.88	....	7.09	7.00	6.76	7.00	7.04	....	....
Agrico for Potatoes	Nashua	5.00	4.89	....	10.62	10.00	10.01	10.00	9.64	2.00	2.12
Agrinite	Nashua	8.25	7.99	....	....	....	....	....	....	....	....
18% Normal Superphosphate	18.00	17.63	....	....	....	....	Lebanon		....	....	....	17.97

* NOT Registered at time of sampling.

	Sample Drawn In	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
American Cyanamid Co. New York, New York											
Aeroprills—Ammonium Nitrate	Brentwood	33.50	34.14	....	....	....	....	....	....	....	....
Armour Fertilizer Works Atlanta, Ga.											
*Armour Bone Meal	W. Lebanon	2.30	2.63	23.00	25.90	....	....	....	....	....	....
*Armour Sheep Manure	W. Lebanon	1.50	1.33	1.00	1.30	....	....	2.00	4.80	....	....
Armour Vertagreen Plant Food 5-10-5	W. Lebanon	5.00	5.02	....	11.00	10.00	10.39	5.00	6.50	....	....
Buell Fertilizer Co. Exeter, N. H.											
Buell Peat and Poultry Manure	Manchester	3.00	3.63	3.00	3.63	....	....	1.50	2.20	....	....
Chilean Nitrate Sales Corp. New York, New York											
Champion Natural Chilean Nitrate of Soda 16%	Concord	16.00	16.04	....	....	....	....	....	....	....	....
Consolidated Rendering Co. Boston, Mass.											
Corenco 4-12-4 Complete Manure	N. Haverhill	4.00	4.19	....	12.12	12.00	11.44	4.00	6.96	....	....
Corenco 4-12-16 Ladino Special	Colebrook	4.00	4.83	....	12.74	12.00	12.45	16.00	16.35	....	....
Corenco 5-8-7 Potato and General Crop	Lebanon	5.00	5.08	....	8.80	8.00	8.55	7.00	7.36	....	....
Corenco 5-10-5 Home Garden Fertilizer	Lebanon	5.00	5.09	....	9.63	10.00	9.41	5.00	5.52	....	....
Corenco 5-10-10 Peerless Potato	N. Haverhill	5.00	5.49	....	10.66	10.00	10.25	10.00	10.00	....	....
Corenco 5-10-10-2	N. Haverhill	5.00	5.33	....	10.34	10.00	9.66	10.00	10.24	2.00	2.14
Corenco Two-In-One 8-16-16	Brentwood	8.00	8.04	....	16.96	16.00	16.27	16.00	16.16	....	....

Corenco Superphosphate 0-20-0	Laconia	....	....	....	20.75	20.00	20.67	....	....	....	....
*Corenco Ground Bone	Lebanon	2.47	2.41	23.00	27.20	....	....	....	....	....	....
Corenco Superphosphate 20%	Concord	....	....	....	20.85	20.00	20.80	....	....	....	....
Corenco Superphosphate 20%	Benton	....	....	....	20.30	20.00	20.12	....	....	....	....
Corenco Superphosphate 20%	Brentwood	....	....	....	20.80	20.00	20.70	....	....	....	....
Davison Chemical Corp. Baltimore, Md.											
Davco Granulated Fertilizer Turf and Garden Food 5-10-5	Concord	5.00	5.00	....	10.10	10.00	9.66	5.00	5.60	....	....
Davco Granulated Fertilizer 5-10-10	Concord	5.00	5.06	....	10.12	10.00	9.86	10.00	10.32	....	....
Davco Granulated Fertilizer 8-16-16	Concord	8.00	8.11	....	17.12	16.00	16.46	16.00	16.65	....	....
Davco Granulated Fertilizer 10-10-10	Concord	10.00	9.61	....	9.72	10.00	9.40	10.00	10.24	....	....
Davco Granulated 20% Superphosphate	Concord	....	....	....	21.75	20.00	21.06	....	....	....	....
Eastern States Farmers Exchange W. Springfield, Mass.											
Eastern States 5-10-10	Manchester	5.00	5.13	....	10.60	10.00	10.17	10.00	11.20	2.00	2.93
Eastern States Fertilizer 5-10-10	Woodsville	5.00	5.06	....	10.80	10.00	10.59	10.00	12.24	2.00	2.69
Eastern States 8-16-16	Manchester	8.00	8.11	....	15.75	16.00	15 36	16.00	16.60	1.00	1.77
Eastern States Fertilizer 8-16-16	Woodsville	8.00	8.24	....	16.50	16.00	16.13	16.00	15.72	1.00	1.68
Eastern States Fertilizer 8-16-16	Pembroke	8.00	8.10	....	16.56	16.00	16.19	16.00	17.10	....	....
Eastern States Fertilizer 8-16-16	Pembroke	8.00	8.19	....	15.80	16.00	15.39	16.00	16.15	....	....
Eastern States 10-10-10	Manchester	10.00	9.92	....	11.07	10.00	10.76	10.00	10.64	1.00	1.53
Eastern States Fertilizer 10-10-10	Woodsville	10.00	10.08	....	10.47	10.00	10.28	10.00	10.80	1.00	1.32
Eastern States Starter 64	Woodsville	16.00	16.02	....	32.05	32.00	32.04	16.00	16.56	....	....
Eastern States Fertilizer 0-15-30	Woodsville	....	....	....	14.99	15.00	14.84	30.00	30.64	....	....
Eastern States 0-20-20	Manchester	....	....	....	19.68	20.00	19.36	20.00	20.56	....	....
Eastern States Fertilizer 0-20-20	Woodsville	....	....	....	20.45	20.00	20.06	20.00	20.32	....	....
Eastern States Granulated Superphosphate 20%	Manchester	....	....	....	21.73	20.00	20.86	....	....	....	....
Faesy & Bestroff New York, New York											
Pure Bone Meal	Manchester	2.47	2.55	23.00	27.90	....	....	....	....	....	....

	Sample Drawn In	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Fertilene Corp. of America New York, New York											
†Fertilene 15-10-5	Nashua	15.00	18.62	....	....	10.00	11.47	5.00	5.01	....	....
Hall Bros. Oil Co. Concord, N. H.											
‡Beauty Lawn	Concord	0.12	0.14	....	....	0.08	0.20	0.04	0.05	....	....
A. H. Hoffman Inc. Landisville, Pa.											
Organic Base Rose Food 5-10-5	Manchester	5.00	4.76	....	11.28	10.00	11.17	5.00	5.40	....	....
Cow Manure for Garden Plants	Manchester	2.00	1.86	1.00	0.92	....	....	1.00	2.00	....	....
Sheep Manure for Garden Plants	Manchester	1.50	1.25	1.00	1.29	....	....	2.00	3.70	....	....
Hy-Trous Corp. Boston, Mass.											
†Hy-Trous Liquid Fertilizer	Manchester	4.00	4.84	....	....	8.00	9.87	4.00	4.99	....	....
International Minerals & Chemicals Co. Woburn, Mass.											
International Fertilizer 5-8-7-1	Nashua	5.00	5.01	....	8.33	8.00	8.05	7.00	6.80	1.00	1.84
*International Fertilizer 5-10-5-1	W. Lebanon	5.00	5.03	....	10.40	10.00	10.01	5.00	5.20	1.00	1.52
International Fertilizer 5-10-10-1	Nashua	5.00	5.01	....	10.60	10.00	10.07	10.00	10.08	1.00	1.53
International Potato 5-10-10-2	W. Lebanon	5.00	5.05	....	10.86	10.00	10.39	10.00	10.20	2.00	3.44
International Fertilizer 6-12-12-2	Colebrook	6.00	6.08	....	12.58	12.00	12.17	12.00	12.01	2.00	2.43
International Fertilizer 7-7-7-1	W. Lebanon	7.00	6.90	....	7.96	7.00	7.78	7.00	7.52	1.00	1.87
*International Fertilizer 8-6-2-1	W. Lebanon	8.00	8.03	....	6.46	6.00	6.23	2.00	2.84	1.00	2.98
International Fertilis 8-6-2-1	Nashua	8.00	8.08	....	6.40	6.00	6.01	2.00	2.48	1.00	3.27

International Fertilizer 8-16-16	Pembroke	8.00	7.75	....	16.40	16.00	16.03	16.00	16.00	....	....
International Fertilizer 8-16-16	Nashua	8.00	7.72	....	15.58	16.00	15.10	16.00	16.16	....	....
International Fertilizer 8-16-16	Colebrook	8.00	7.82	....	15.99	16.00	15.63	16.00	16.08	....	....
*International Fertilizer 10-10-10-1 ...	Nashua	10.00	9.60	....	10.70	10.00	10.37	10.00	10.24	1.00	1.67
*International Fertilizer 0-15-30	Londonderry	....	....	....	15.98	15.00	15.77	30.00	28.00	....	....
International Fertilizer 0-15-30	Colebrook	....	....	....	15.48	15.00	15.26	30.00	29.08	....	....
*International Fertilizer 0-20-20	W. Lebanon	....	....	....	18.95	20.00	18.42	20.00	21.12	....	....
*International Bone Meal	Nashua	2.47	2.48	23.00	26.00	....	....	....	....	....	....
International Mellow Green	W. Lebanon	5.00	5.58	....	6.02	4.00	5.28	....	....	....	....
*International Sheep Manure	Nashua	1.25	1.65	1.00	1.54	....	....	2.00	4.96	....	....
International Superphosphate 20% ...	Nashua	....	....	....	21.10	20.00	20.69	....	....	....	....
Lawn Tex Inc. Chicago, Ill.											
Organi-Green 5-4-0	Manchester	5.00	5.42	....	5.52	4.00	4.87	....	....	....	....
MacDuffie Petroleum Co., Inc. Nashua, N. H.											
‡Fertilene	Nashua	0.15	0.64	....	....	0.10	0.19	0.05	0.05	....	....
Merrimack Farmers Exchange, Inc. Concord, N. H.											
Merrimack Fertilizer 5-8-7	Epping	5.00	5.17	....	8.82	8.00	8.51	7.00	7.52	....	....
Merrimack Fertilizer 5-10-10	Manchester	5.00	5.00	....	10.72	10.00	10.31	10.00	10.38	....	....
Merrimack Fertilizer 5-10-10	Epping	5.00	5.28	....	10.70	10.00	10.34	10.00	10.40	....	....
*Merrimack Fertilizer 5-10-10-2	Brentwood	5.00	5.68	....	11.77	10.00	11.48	10.00	11.52	2.00	2.30
Merrimack Fertilizer 7-7-7	Epping	7.00	7.01	....	7.54	7.00	7.39	7.00	7.12	....	....
Merrimack Fertilizer 8-16-16	Benton	8.00	6.81	....	15.42	16.00	14.81	16.00	15.28	....	....
Merrimack Fertilizer 8-16-16	Concord	8.00	7.95	....	....	16.00	16.48	16.00	15.56	....	....
Merrimack Fertilizer 8-16-16	Concord	8.00	7.87	....	16.73	16.00	16.20	16.00	16.24	....	....
Merrimack Fertilizer 8-16-16	Brentwood	8.00	7.93	....	16.86	16.00	16.18	16.00	16.16	....	....
Merrimack Fertilizer 10-10-10	Benton	10.00	9.44	....	10.60	10.00	10.41	10.00	10.16	....	....
Merrimack Fertilizer 0-15-30	Benton	....	....	....	15.21	15.00	15.10	30.00	30.08	....	....
Merrimack Fertilizer 0-15-30	Concord	....	....	....	15.38	15.00	15.29	30.00	30.04	....	....
Merrimack Fertilizer 0-15-30	Concord	....	....	....	15.29	15.00	15.21	30.00	29.72	....	....
Merrimack Fertilizer 0-20-20	Manchester	....	....	....	21.00	20.00	20.84	20.00	20.20	....	....
Merrimack Fertilizer 0-20-20	Laconia	....	....	....	20.10	20.00	20.00	20.00	20.08	....	....

† Liquid, concentrate.

‡ Liquid, dilute, as applied.

* NOT Registered at time of sampling.

	Sample Drawn In	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Monsanto Chemical Co. St. Louis, Mo.											
Folium 20-20-20	Concord	20.00	22.25	....	....	20.00	19.00	20.00	17.20	....	....
Natural Plant Food Co. Oklahoma City, Oklahoma											
Longhorn Brand Cattle Manure 2-1-2	Manchester	2.00	1.85	1.00	1.00	....	....	2.00	2.00	....	....
Ramshorn Brand Sheep Manure	Manchester	2.00	1.54	1.00	1.02	....	....	2.00	2.40	....	....
Old Fox Agricultural Sales Inc. E. Providence, R. I.											
Old Fox Fertilizer 5-10-10	Pembroke	5.00	5.13	....	11.10	10.00	10.10	10.00	10.48	....	....
Old Fox Fertilizer 5-10-10	Pembroke	5.00	5.08	....	10.67	10.00	10.05	10.00	10.68	2.00	3.01
Old Fox Fertilizer 5-10-10-2	Exeter	5.00	5.03	....	10.78	10.00	10.23	10.00	10.40	2.00	2.60
*Old Fox Fertilizer 7-7-7	Exeter	7.00	7.27	....	7.84	7.00	7.45	7.00	7.60	....	....
Old Fox Fertilizer 8-16-16	Exeter	8.00	8.01	....	16.84	16.00	16.47	16.00	16.50	....	....
Old Fox Fertilizer 10-10-10	Concord	10.00	9.76	....	10.60	10.00	10.45	10.00	10.54	....	....
*Sulphate of Ammonium 20-0-0	Pembroke	20.00	20.29	....	....	....	....	....	....	....	....
Plantabb Corp. Baltimore, Md.											
Fulton's Plantabb's	Manchester	11.00	11.18	....	18.56	15.00	18.56	20.00	22.80	....	....
Potash Company of America Carlsbad, New Mexico											
Muriate of Potash 60%	Woodsville	....	....	....	....	....	....	60.00	61.30	....	....

Ra-Pid Gro Corporation Dansville, New York											
Ra-Pid-Gro 23-21-17	Groveton	23.00	23.08	....	20.27	21.00	20.27	17.00	17.02	....	....
Sagadahoc Fertilizer Company, Inc. Bowdoinham, Maine											
Sagadahoc Fertilizer 5-10-10	Colebrook	5.00	5.00	....	10.74	10.00	9.63	10.00	10.16	2.00	2.16
*Sagadahoc Fertilizer 8-12-12	Northumberland	8.00	8.00	....	13.08	12.00	12.01	12.00	12.04	2.00	2.02
*Sagadahoc Bone Meal	Groveton	2.00	1.13	18.00	22.04	....	....	....	....	....	....
O. M. Scott & Sons Merrysville, Ohio											
Scott's Turf Builder 9-7-4	Manchester	9.00	9.30	....	7.74	7.00	7.37	4.00	5.70	....	....
Scott's Weed and Feed	Manchester	7.00	6.47	....	13.38	11.00	12.74	5.00	6.54	....	....
Sewerage Commission of the City of Milwaukee Milwaukee, Wisconsin											
Milorganite	Nashua	5.50	5.50	4.75	4.20	4.00	3.66	....	....	....	....
Smith Equipment Co. Chicago, Illinois											
†*Fertil-Ade 10-8-6	Manchester	10.00	10.98	....	....	8.00	9.35	6.00	6.20	....	....
Swift & Co. Boston, Mass.											
Swift's Red Steer Brand Plant Food 5-8-7	Manchester	5.00	5.11	....	8.88	8.00	8.53	7.00	8.00	....	....
*Vigoro Complete Plant Food 5-10-5	Manchester	5.00	4.85	....	10.52	10.00	10.11	5.00	5.40	....	....
Golden Vigoro Complete Plant Food 6-10-4	Manchester	6.00	6.01	....	11.02	10.00	9.70	4.00	4.40	....	....
Vigoro Complete Plant Food 6-10-4	Manchester	6.00	5.87	....	10.56	10.00	10.10	4.00	5.20	....	....
Water Soluble Instant Vigoro 19-28-14	Manchester	19.00	19.05	....	28.05	28.00	28.05	14.00	16.15	....	....

* NOT Registered at time of sampling.

† Liquid, concentrate.

	Sample Drawn In	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Tenny Coal Co. Concord, N. H.											
‡Folium	Concord	0.20	0.63	....	....	2.20	0.39	0.20	0.20	....	....
Walker-Gordon Lab. Plainsboro, N. J.											
Bovung Cow Manure	Nashua	2.00	2.01	1.00	1.15	....	....	1.00	2.02	....	....

* NOT Registered at time of sampling.
‡ Liquid, dilute, as applied.

The following products were unregistered by the New Hampshire Department of Agriculture at the time they were found exposed for sale, but samples were not drawn.

American Agricultural Chemical Co. Muriate of Potash 0-0-60	No. Weymouth, Massachusetts
Atkins & Durbrow, Inc. Driconure 1-1-1	New York 38, N. Y.
Breck & Co., Joseph Breck's Turf Gro 8-6-2 Breck's Quick-Life 14-30-16 Breck's Garden Gro 5-10-10	Boston, Massachusetts
Clinton Nurseries New Era Rose Food 5-10-5 New Era African Violet Food 5-12-12 New Era Cow Manure 1.5-1-1 New Era Plant Food 5-12-9	Clinton, Connecticut
Consolidated Rendering Company Coreno Ground Bone 2-22-0	Boston, Massachusetts
Feasy & Besthoff, Inc. F & B Pure Bone Meal 2.47-23-0 Broadleaf High Organic 6-10-4	New York 13, N. Y.
Rogers & Hubbard Company Gro-Fast 4-10-4	Portland, Connecticut
Rose Manufacturing Company Tri-O-Gen Rose Food 5-10-5 Viol-Ogen Plant Food 13-26-13	Beacon, N. Y.
Stim-U-Plant Laboratories Stim-U-Plant 11-12-15	Columbus 16, Ohio
Victor Chemical Works Take-Hold Plant Starter Solution Mix 10-52-17	Chicago 14, Illinois